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ABSTRACT

Following up two previous studies which identified the course content, and essential skills and knowledge outcomes for graduate introductory educational research courses, further study was conducted to determine the following: which of the skills identified for graduate introductory research courses were quantitatively or qualitatively oriented; what demographic differences exist among professors who teach graduate introductory educational research courses; and specifically what differences exist between veteran professors (those who had taught the course for 15 years and more) and novice professors (those who had taught the course for less than 5 years). Questionnaires which sought demographic data were distributed to 139 Professors of Educational Research. A quantitative subscale which omitted some additional researcher judgements including validity, was constructed from among the 59 skills identified by classifying items as quantitative or qualitative. Twenty-two items comprised the quantitative subscale with a subscale score computed for each respondent. Analyses of Variance were conducted between the quantitative subscale scores and the various demographic variables. Study findings include the following: (1) 70% of the sample viewed the course as quantitatively oriented; (2) veteran professors displayed a higher quantitative subscale score. Among other observations, the study noted that a shift in methodological paradigms to include qualitative methodology is occurring in introductory educational research courses. Appended is the Research Skills and Knowledge Areas Questionnaire. Includes seven references. (LPT)

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Graduate Introductory Educational Research Courses: A Comparison of Requirements of Veteran and Novice Professors

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Graduate Introductory Educational Research Courses: A Comparison of Requirements of Veteran and Novice Professors

A considerable number of authors of introductory educational research textbooks state in their prefaces that their aim is to prepare students to become consumers of research. Consequently, a significant amount of attention is given to how one may analyze research approaches, assess generalized results, and justify the rationales for studies, i. e., how to critically evaluate research reports. Another view of the course is as utilitarian, leading to a research project, usually a master's thesis. Others perceive the course not only as an introduction to the research process but also as a prerequisite to a statistics course or an advanced educational research course or seminar. Although syllabi detail the objectives for these courses, such documents tend to be rather general, and instructors even in the same department who have responsibility for the course sometimes may diverge from the common, department-adopted syllabus.

A diversity of practices apparently exists regarding the actual content taught in introduction to educational research courses taught at the graduate level—despite the fact that stated goals, objectives, and content in many commonly adopted textbooks reflect notable homogeneity.

In a recent Delphi study by Todd and Reece (1989) a national panel of 21 experts in educational research nominated by the members of the Special Interest Group: Professors of Educational Research (SIG: PER) of the American Educational Research Association generated a list of 114

skills and knowledge areas they considered worthy objectives in an introductory course. Of those 114 skills and knowledge areas 59 were found to be "Essential," "Essential-Important," or "Important." The panel reached a consensus that 38 of the skills and knowledge areas were "Essential," 8 were determined to be "Essential-Important," and 13 were said to be "Important." These 59 were skills that the panel felt anyone should possess who had satisfactorily completed an introductory course in educational research.

The Delphi study left unanswered the question "What is the relationship between what experts say should be taught in an introductory course and what is actually required in practice?" A more recent study by Todd and Reece (1990) represented an attempt to address this question.

The membership of the Special Interest Group: Professors of Educational Research within the American Educational Research Association was surveyed to determine their course requirements. A basic assumption of that study was that these 139 members would constitute a representative sample of professors who teach such a course since they were scattered throughout the country from 39 states, the Philippines, and Canada, representing institutions of various population sizes. It was found that a majority of the SIG: PER respondents agreed with the Delphi panel that these 59 skills were "Essential," "Essential-Important," and "Important." Demographic data were also gathered from the respondents as a part of the questionnaire they were sent. The information sought is reflected in the following questions from the questionnaire which are presented in Table 1.

Table 1
Frequencies of Demographic Items Presented in Questionnaire Format

Do you currently teach a graduate introductory educational research course?

Yes 53 (55.8%) No 42 (44.2%)

If not currently teaching such a course, have you taught it within the past five years?

Yes 34 (35.8%) No 8 (8.4%)

How many years have you taught this course?

Less than 5 years	16 (16.8%)
5-10 years	21 (22.1%)
10-15 years	23 (24.2%)
More than 15 years	33 (34.7%)
[no response]	2 (2.1%)

Is your approach to teaching this course more oriented toward

qualitative research	5 (5.3%)
quantitative research	66 (69.5%)
both	24 (25.3%)

Please check the statement which best reflects your perception of a one-semester course in research.

40 (42.1%) As an only course in research methodology at the master's degree level to produce a consumer of research

46 (48.4%) As an introductory course to be followed by a course in statistics or a statistics course to be taken concurrently, leading to a research study or master's thesis

9 (9.5%) No response]

Do you feel this should be a two-semester course?

Yes 42 (44.2%) No 49 (51.6%)

[No response 4 (4.2%)]

Purpose

While the 1990 study by Todd and Reece focused on the relationship between what the Delphi panel deemed essential and/or important with regard to course content and what the AERA SIG: PER group required, still missing was the relationship with regard to the demographic data. The present study extended the question. What demographic differences exist among professors who teach the course? Specifically, what differences exist between veteran professors (those who have taught the course 15 years or more) and novice professors (those who have taught the course less than five years)?

Since in the previous (1990) study there had seemed to be some attitudinal differences among instructors of varying classroom longevity as well as of different methodological orientations—quantitative or qualitative (see Table 1 frequencies), the need existed to determine which of the skills were quantitatively oriented and which were qualitative.

In recent years there has been the problem of identifying precisely what constitutes qualitative research as opposed to quantitative research because of the profusion of terms used to describe qualitative processes. However, three very recent texts do offer a simplistic distinction between the terms with regard to analysis of data.

Hopkins and Antes (1990) state:

> Efficiency can be built into the methodology by recording the original raw data in an easily interpretable form to expedite analysis. Qualitative studies using words will need a much different arrangement at this stage than a quantitative study, where the facts are sets of numbers (p. 137).

Wiersma (1991) asserts:

> Quantitative research relies heavily on statistical results represented with numbers; qualitative research relies heavily on narrative description (p. 14).

Ary, Jacobs, and Razavieh (1990) suggest:

> The research methods described in Chapters 9-12 [Experimental, Causal-Comparative, Descriptive, Survey] use numbers to answer questions. Such procedures are classified as quantitative research, as they employ such quantitative measures as counts, means, correlations, and t-tests. In contrast, qualitative research employs words to answer questions (p. 444).

A quantitative subscale was constructed from among the 59 skills by classifying items as quantitative or not according to Ary, Jacobs, and Razavieh (1990) and, in a few instances, some additional researcher judgment—for example, validity, an issue in all research, does not fall exclusively in either but was excluded from the quantitative subscale. A total of 22 items comprised the quantitative subscale, and a subscale score was computed for each respondent. (See items in Appendix A.)

In order to investigate the demographic data more comprehensively, Analyses of Variance were conducted between the quantitative subscale scores and various demographic variables noted above.

Findings

Frequencies for demographic items in the questionnaire were tallied and frequencies of responses are displayed in Table 1, above. Eighty-seven of the 95 respondents teach the course now or have taught it within the past five years. About one-third of the respondents have taught the course more than 15 years, and a majority have taught it more than 10. A larger

majority of nearly 70% view the course as quantitatively oriented. Division of opinion existed with regard to whether the course should stand alone (as shown in Table 1 where 40 indicated the subject as an only course in research methodology and 46 indicated it to be introductory to statistics). Comments included that the nature of the course depends on the nature of the institutional program. Further, 42 said the course should be two semesters in length, while 49 said it should not. At one institution it is a one-semester course for master's students but two semesters for doctoral students. At others it is part of a four- or five-quarter sequence.

SIG: PER respondents had indicated on their questionnaires "yes" or "no" according to whether each of the 59 skills was a course requirement. A total score was calculated for each respondent by tallying the number of "yes" responses. A one-way ANOVA of total scale scores by number of years having taught the course yielded no statistically significant differences [$F(3, 89) = 2.35$] at $p < .05$; however, at $p = .078$ instructors who had taught the course less than five years (novice professors) exhibited a total scale mean which was lower than those who had taught it more than 15 years (veteran professors). Also in the same study significantly more instructors who taught the course with a qualitative orientation or with both a qualitative and quantitative orientation indicated that the course should be two semesters, and fewer "quantitative" instructors than would be expected by chance alone saw a need for a second semester ($X^2 = .27$; $p = .027$). These results led to further exploration and creation of the quantitative subscale presently under discussion.

It was informally hypothesized that the veteran professors would

display a higher quantitative subscale score, and, indeed, such was the case. Table 2 displays the results of a oneway Analysis of Variance using years of teaching as the independent variable. A Scheffe follow-up test revealed the difference as lying between the novice and veteran professors. It may be observed that these veteran professors not only achieved the highest mean but also the smallest amount of variance (see Table 3). (It should be noted here that other Analyses of Variance among the demographic variables revealed no other main effects nor any interactions; further, stepwise multiple regression confirmed that of all the demographic variables, only Number of Years Having Taught was significant.) Table 4 shows a frequency breakdown of years teaching by qualitative/quantitative orientation. Perusal of the table reveals the disproportionate number of veteran professors with a self-reported quantitative orientation.

Table 2
Summary of the Results of the Analysis of Variance (ANOVA) of Number of Years Having Taught Introductory Educational Research

Source	SS	df	MS	F
Between	142.68	3	47.56	3.57*
Within	1173.44	88	13.33	
Total	1316.12	91		

* p = .017

Table 3
Table of Means on Quantitative Skills by Number of Years Having Taught Introductory Educational Research

Group	Number of Years	n	Mean	S.D.
1	Less than 5 years	16	15.44	4.24
2	5-10 years	21	17.76	4.35
3	10-15 years	22	18.09	3.72
4	More than 15 years	33	19.06	2.72
	Total	92		

Table 4
Breakdown of Frequencies--Quantitative Subscale by Years Having Taught by Self-Reported Quantitative/Quantitative Orientation*

Number of Years	Orientation: Qualitative (or both) Mean	n	Quantitative Mean	n	Row Totals: Range / Mean / S.D.
Less than 5 years	14.14	7	16.44	9	2.31 / 15.44 / 4.24
5-10 years	17.57	7	17.85	14	0.29 / 17.76 / 4.35
10-15 years	18.00	8	18.14	14	0.15 / 18.09 / 3.72
More than 15 years	20.00	6	18.85	27	1.16 / 19.06 / 2.72
Column Totals: Range	5.85		2.42		
Mean	17.36		18.14		17.90
S.D.	4.25		3.60		3.80

* Because of cell frequencies of 1 in the qualitative category, an ANOVA could not be conducted except by combining categories which included a qualitative component. No significant differences were found by qualitative/quantitative orientation. On the other hand, in the previous study a significant chi square difference was found in frequencies; more veteran professors than would be expected by chance alone reported themselves to be quantitatively oriented.

Discussion

There seems to be a stronger emphasis now than in the recent past toward a qualitative approach to research. Lincoln (1989) contended that there is in fact a paradigm revolution in progress, away from the positivistic/quantitative research methodology and toward a qualitative, more naturalistic or ethnographic research approach. Smith's (1987) article on publishing qualitative research in the AERJ has, without doubt, lent encouragement to those who grant credence and attribute validity to the methodology. At best, some among the study population saw a need for both--that the two approaches offer, in tandem, tools for a multifarious, more balanced approach in the knowledge quest.

While the study did not reflect what a random sample of professors of educational research think should be taught in an introductory course, it did reflect what one respected group of professors believe should be the course content and what they actually teach. The problem of identifying and selecting a national random sample remains to be solved. On the other hand, the utility of exploring how other smaller identifiable populations of professors of educational research handle core course requirements is a viable avenue of exploration which could certainly add insight into trends.

In conclusion, three (among other?) observations may be made:

(a) Mature, skilled professionals (those having taught research 15 or more years) have converged on the essential core content of the introductory educational research course, and they are purveying it quite efficiently in one semester; and/or

(b) Mature, skilled professionals exemplify an educational myth/truism—that one tends to teach what one was taught, in much the same manner, and with similar emphases; and/or

(c) A shift in methodological paradigms is occurring much as has been described by Lincoln, Clark, and Peterson (1989) as well as others. Perusal of new texts and new editions of older texts reveals that additional material is being presented which deals with a "qualitative" methodology—in spite of the fact that, as Hopkins and Antes (1990) pointed out, "Qualitative data in the form of words rather than numerical values underlie all research. . . . the term qualitative should not be viewed as a method unto itself" (p. 269). Nevertheless, it is the term that is achieving common usage (cf. Smith, 1987)—a term which nearly everyone now "understands" but which no one, apparently, has yet comprehensively or concisely defined. "It is not surprising that those whose orientation lies outside the 'qualitative' paradigm have difficulty communicating with those on the inside, for indeed, those [experts] on the inside . . . have some difficulty among themselves as is evidenced by lack of agreement on [items in the Delphi study]" (Todd & Reece, 1989, p. 28).

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Appendix A

RESEARCH SKILLS AND KNOWLEDGE AREAS QUESTIONNAIRE

		Yes	No
1.	Understands what constitutes research		
2.	Understands what a scientific study involves		
3.	Can state a problem or question in such a way that it is amenable to the research process		
4.	Knows how to operationalize variables		
5.	Can identify questions or problem statements that do not lend themselves to the scientific method of analysis		
6.	Demonstrates an understanding of research terminology		
7.	Can converse confidently with others about the research process		
8.	Can conduct a review of related literature		
9.	Has familiarity with the CURRENT INDEX OF JOURNALS IN EDUCATION		
10.	Can use the THESAURUS OF ERIC DESCRIPTORS		
11.	Is familiar with the use of the MENTAL MEASUREMENTS YEARBOOK		
12.	Can read journal articles and research reports with understanding		
*13.	Can formulate a testable hypothesis		
*14.	Understands the meaning of the null hypothesis and why it is written thus		
*15.	Understands what is involved in the Experimental Method of solving a research problem		
*16.	Has a knowledge of the types of variables that must be dealt with in a basic experimental design		
*17.	Understands and can explain differences between true experiments and quasi-experiments		
*18.	Has a knowledge of the various sampling procedures		
19.	Can identify situations in which the Ex Post Facto approach would be appropriate		
20.	Knows the difference between primary and secondary sources		
21.	Has a familiarity with the various types of Descriptive Research Methods		

* Items comprising the quantitative subscale.

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Appendix A (Continued)

		Yes	No
22.	Can identify weaknesses in opinionnaire statements		
* 23.	Knows how to select a random sample		
* 24.	Is familiar with measures of central tendency and knows when it is appropriate to use each		
* 25.	Has an understanding of variability in a distribution		
* 26.	Has an understanding of the standard deviation		
* 27.	Understands the meaning of correlation		
* 28.	Has an understanding of the concept of Type I and Type II errors		
* 29.	Has an understanding of and can interpret levels of significance		
* 30.	Has an understanding of the t-test		
* 31.	Has an understanding of the F-ratio		
* 32.	Has an understanding of the Chi-Square Test of Independence		
33.	Understands the concept of internal validity		
34.	Can describe the threats to internal validity		
35.	Has an understanding of how design arrangements can reduce threats to internal validity		
36.	Understands the concept of external validity		
37.	Can describe the threats to external validity		
38.	Has an understanding of validity and the various types of validity		
* 39.	Has an understanding of reliability and how it can be determined		
40.	Knows the various components of a research proposal		
41.	Can actually write a research proposal including an organized review of related literature		
42.	Has an understanding of the basic ethical and legal considerations in conducting research		
43.	Has developed a familiarity with research-oriented periodicals in his/her own field or area of interest		
44.	Can critically evaluate a research report		

		Yes	No
45.	Has become a more critical listener		
* 46.	Can interpret charts and graphs		
47.	Appreciates the underlying assumptions/rationale of qualitative and quantitative methodologies		
48.	Can identify the type (method) of research represented by a particular study (experimental, etc.)		
49.	Can interpret bias in design and testing		
* 50.	Can distinguish between a single-variable group design and a factorial design		
51.	Understands the nature of causation and causal linkages		
52.	Understands problems of direction of causality in correlational research		
* 53.	Understands the various methods for summarizing different research studies on the same problem, especially the method of meta-analysis		
54.	Understands importance of research replication		
55.	Understands the role of research in improving educational practice		
56.	Is familiar with basic research resources such as Encyclopedia of Educ. Research, Review of Educ. Res., Review of Res. in Educ., and Handbook of Research on Teach.		
57.	Is familiar with basic research resources such as Psychological Abstracts, Sociological Abstracts, Social Sciences Citation Index, & Education Index		
* 58.	Understands the logic underlying hypothesis testing		
* 59.	Can discuss why numerical analysis is useful		